Exemption No. 5619

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
RENTON, WASHINGTON 98055-4056

In the matter of the petition of

Boeing Commercial Airplane Group **Regulatory Docket No. 27215**

for an exemption from § 121.314
of the Federal Aviation Regulations

PARTIAL GRANT OF EXEMPTION

By letter B-TO2T-92-0428 dated March 12, 1993, Mr. K. B. Buchanan, Manager, Airworthiness, Orgn. B-TO2T, Mail Stop 05-02, Boeing Commercial Airplane Group, P.O. Box 3707, Seattle, Washington 98124-2207, petitioned for an exemption from the cargo compartment liner requirements of § 121.314 of the Federal Aviation Regulations (FAR). This exemption effects the latches used on the decompression vent doors, and the joints between the decompression vent doors and the partition structure on the Boeing Model 747-400 and 747-400D airplanes. The petition is on behalf of all affected operators.

Section of the FAR affected:

Section 121.314, Amendment 121-202, which prescribes requirements for cargo and baggage compartments.

Related sections of the FAR:

Section 25.857 which prescribe requirements for cargo and baggage compartments, and Part 25, Appendix F, Part III which prescribes flammability requirements of liner material.

The petitioner's supportive information is as follows:

> "This is a petition for a permanent exemption for all 747-400 PAX/Combi and 747-400D operators. This petition does not apply to the 747-100/-200/-300 airplanes."

The 747-400 and 747-400D designs have "C" Lower Lobe Cargo Compartments and must comply with the subject Fireworthiness Regulation for Cargo Liners. The forward partition (just aft of the main Electrical/Electronic (E/E) equipment bay) has two small areas which do no comply with the fireworthiness requirements of FAR 121.314, Amendment 121-202. These non-compliant areas are comprised of the following two parts:

(1) The latches used on the decompression vent doors.

(2) The joints between the decompression doors and partition structure.

"Items (1) and (2) are each part of the two doors located in the forward partition. These two doors have the dual function of providing access to the E/E bay and to provide decompression venting between the E/E bay and the forward lower lobe cargo compartment. Any changes to the design of these two items could affect certification of the decompression vent system and the Halon retention capability of the cargo compartment."

"It should be noted that the latches (item (1)) are made of 2024-T3 aluminum alloy, except for the nylon latch plug, which is the only part of the latch not in compliance with FAR 121.314, Amendment 121-202. The purpose of the nylon latch plug is to provide a positive latch and seal for Halon retention.

"If the latch plug were to burn, the door would still remain in the closed position for Halon retention in the cargo compartment. There are also two latches, either of which can latch the door in the closed position. Enclosure B provides specific design details for the latches on the decompression vent doors.

"The total percentage area not in compliance for both items (1) and (2) is extremely small (66 square inches) in comparison to the total forward partition area which is 12,797 square inches (less than 0.5%). The total area of items (1) and (2) is also small in comparison to the aluminum close out panel located at the bottom of the partition. This aluminum close out panel is not required to comply with the oil burner test of Amendment 121-202."

"Boeing requests this be a permanent exemption. To redesign the decompression vent doors by replacing the seals and recertifying the door for decompression and the cargo hold for Halon retention would be a severe cost burden to the operators which is not warranted by improvements in safety.

"The rubatex door seal material has compressive seal characteristics which assist in

preloading the latches. This preloading assists in the decompression door meeting its intended function when a certain pressure differential is experienced. Any replacement of the rubatex seal must meet the dual requirements of decompression and seal against Halon loss.

"A replacement of the seal will most likely require expensive certification flight testing to revalidate both decompression and Halon retention have not been compromised."

"The rubatex seal is configured in a sandwich between the door and partition structure and is not exposed to any direct flame except from only a local upward flame located on the floor and against the partition. The probability of localizing such a flame is remote. Further, Halon discharge would immediately suppress any actual fire and keep the compartment temperature at a reduced level.

"Boeing believes the rubatex seal material is protected by an effective shroud except for a very small area on the sloping door side. The width of the compressed seal has been measured at .20 to .25 inches. The probability of impingement on the seal from a local flame is extremely low and the duration of the flame would be short due to Halon discharge. It is Boeing's opinion that there is not an inherent safety problem with the existing rubatex seal design."

"Reference (b) is Boeing's petition for an exemption to FAR 25.855(c), Amendment 25-60 for the 747-400F. The petition is identical to this petition except for the item 3 enclosure A, close out panel which has subsequently been modified for compliance and is no longer an issue. When the reference (b) petition was submitted, Boeing should have submitted a petition for Amendment 121-202. We apologize for the oversight. The two petitions, however, in content, are now the same and approval of either one should accommodate the other. Due to the March 18, 1993, deadline for Amendment 121-202, Boeing requests expedited handling of this letter petition by the FAA."

Granting the petition would be in the public interest because it would:

(1) Save the operator the expense of redesign and recertification which would not result in any commensurate increase in safety.

(2) Improve the potential for sale to foreign operators, thereby improving the U. S. balance of payments.

The FAA finds, for good cause, that action on this petition should not be delayed by publication and comment procedures for the following reasons: (1) delay in acting on the petition would be detrimental to the operators represented by the petitioner in that it could result in removal from service of aircraft, and (2) the justification for this petition are identical to that published in Docket 26922 for the Boeing Model 747-400F for which no comments were received.

The FAA's analysis/summary is as follows:

> The FAA has carefully considered the information provided by the petitioner, as well as other relevant information, and has determined that there is sufficient merit to warrant partially granting this petition. The following background information, not provided as part of this petition was considered:
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> The FAA has conducted testing of cargo compartment liners with small diameter holes in them and has determined that 0.375 and smaller diameter holes in the ceiling of the cargo compartment would meet the 400°F requirement. (A copy of the test report, FAA Technical Note DOT/FAA/CT-TN89/17, has been placed in the Rules Docket). However the testing did not investigate the fire containment ability of the compartment with the 0.375 inch diameter hole. The hole that would result from the latch handles burn-through is a 0.375 inch diameter hole. The surface of the E/E equipment bay that would be behind the holes is not located in close proximity, not flammable material and therefore would not be adversely affected by the fire properties of the local cargo liner. Also, if the latch handles burn through the decompression vent door will remain latched in the closed position.
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> With respect to the joint between the decompression vent doors and the partition structure the seal material does not meet the burn through requirements § 121.314. Boeing has requested an exemption for this seal based on the high cost of recertification and retrofit for this small part. Also, Boeing does not consider that the replacement of the seal would improve the safety of the airplane. The FAA does not agree with the Boeing position concerning the seal. The retention of the Halon is critical when there is indication of smoke/fire in the cargo compartment. Burn-through of the seal could result in escape of the Halon. Also, Boeing has not attempted to find a replacement material for the seal. Therefore, the FAA has determined that the seal should be replaced. Due to the severe burden that would be placed on operators if the exemption request were denied altogether, temporary relief is warranted.

In consideration of the foregoing, I find that a partial grant of exemption is in the public interest, and will not adversely affect safety. Therefore, pursuant to the authority contained in §§ 313(a) and 601(c) of the Federal Aviation Act of 1958, delegated to me by the Administrator (14 CFR 11.53), the petition of the Boeing Commercial Airplane Group for exemption from the requirements of § 121.314 of the FAR is granted for Models 747-400 and 747-400D airplanes equipped with Class "C" Lower Lobe Cargo Compartment as follows:

(1) a permanent grant of exemption for the latches used on the decompression vent doors.

(2) a temporary grant of exemption, until March 20, 1994, for the joints between the decompression vent doors and partition structures.

Issued in Renton, Washington, on

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Transport Airplane Directorate,
Aircraft Certification Service,
ANM-100

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